Remarks/Arguments:

This is a reply to the office action of April 16.

The claims have been amended to comply with the requirements of 35 USC 112, and to better distinguish this invention from the prior art.

Amended claim 18 is basically a combination of previously presented claims 18, 20 and 24. Claim 19 has become redundant and accordingly is canceled. The other independent claims have been similarly amended, and redundant or inconsistent dependent claims have been deleted.

The claims have been amended to obviate the rejections under 35 USC 112.

a) Ions are stable and unique

In the second paragraph on page 2 of the Office Action, the examiner states it would not be clear to him how "ions" could be used to mark a product. In his opinion the term "ion" would be best understood as an atom or molecule that has lost an electron and it would not be clear to him how an atom missing an electron would be unique and could be used as a "marker".

Of course, an ion is not necessarily an atom or molecule that has lost an electron. There are two sorts of ions, i.e. positively charged cations (to which the definition of the examiner would apply) and negatively charged anions. The present invention is concerned with both types of ions, as can be readily gathered from e. g. the dependent claims 25 to 28.

We infer that the examiner considers that ions are not stable. However, that is not so. Apart from a few very exotic ions which are not the subject matter of the present invention, ions are known to be very stable. Indeed, elements like the alkali metals or the halogens show a clear tendency to enter the ionic state, since for them this is the more stable state than the elemental state. The reason behind that is known to every chemist and is described as the desire of the elements to enter the state of a noble gas. As is known, noble gases are the most stable elements in the periodic table. Alkali metals may reach the electron configuration of the closest noble gas by losing one electron. On the other hand, halogens reach the state of the closest noble gas by gaining one electron. In both cases, the result is an ion having the electron configuration of the closest noble gas. This is a very stable state. The respective ions, such as sodium or potassium cations or chloride or bromide anions, are widely found in nature.

It can be easily shown that, for example, the sodium ion in a solution is much more stable than the element sodium per se: if one adds sodium to water, a quite violent chemical reaction takes place, resulting in the formation of sodium ions. On the other hand, when one adds sodium ions to water, nothing happens but a dissolution of the respective sodium salt compound. This is well known to everybody who has ever added conventional cooking salt to water. No violent chemical reaction takes place, but simply the very soluble sodium chloride is dissolved in water.

This simple example reveals the particular suitability of e. g. sodium ions or chloride ions as markers in accordance with the present invention: in an aqueous environment, those ions are very stable and will not react with any water molecule, for example. Therefore, their identity and concentration can be readily determined.

The examiner wondered how an atom missing an electron is unique and can be used as a marker. Applicant is unsure what was meant.. Each element of the periodic table is unique in that it has a specific structure which differentiates said element from any

other element of the periodic table. Any ion derived from an element is likewise unique: for example, a sodium ion is different from a chloride ion, and this can be readily determined by standard analytic methods.

There is a specific category of electrodes which are called ion-selective electrodes. Those ion-selective electrodes are the most preferred embodiment of the present invention and are capable of detecting a specific sort of ion. Those electrons are well known to the skilled person and need not to be discussed in detail.

In summary, applicant respectfully submits that it is common knowledge to a chemist of ordinary skill that ions as used in the present invention are very stable and easily distinguishable from each other. They are therefore quite suitable as marker substances in accordance with the present invention. The above basic facts can be readily verified by looking into any standard textbook of chemistry. Should the examiner remain unconvinced on this point, he is kindly invited to cite evidence in support of his position.

b) No reaction / adverse taste

On page 2, bottom, of the present Office Action, the examiner stated he would not believe that seawater is inert to the materials being marked or to living organisms. From the passage bridging pages 2 and 3 of the Office Action, it is not clear to the applicant what the examiner actually meant by "inert". According to the understanding of a skilled person (i.e. a chemist), an inert substance is a substance which does not react with other substances in a given environment. The present specification does not contain the word "inert", and Applicant is not aware of any reaction seawater would undergo with a living organism or an alcoholic beverage or perfume, which are the substances to be marked, according to the amended claims. As pointed out in section [0027] of the specification as published, seawater is a natural occurring material and

has been proven for already million of years to be compatible with human and animal health. Probably billions of people go for a swim each year without suffering any health damage. The examiner's position is therefore respectfully traversed.

In any event, the concept of the present invention is not adding seawater to an alcoholic beverage or a perfume. Rather, only the ions contained in standard seawater are added and used as markers. To illustrate this, according to the present invention a bottle of whisky is not marked by adding a certain amount of seawater, but by adding only sodium ions, for example. This is of course something quite different. This has also to be borne in mind when discussing the next statement of the examiner, according to which seawater would be a contaminant to e.g. alcoholic beverages or cosmetics. Basically, any substance which is added to a pure substance can be considered an impurity or contaminant of said pure substance. Therefore, the addition of any marker substance to a pure substance would result in technical "contamination" of the substance. Otherwise, it would impossible to mark any of those substances.

One question is whether the marker substances used in accordance with the present invention have an adverse taste to the beverages. Also here, the applicant would like to invite the examiner to consider a product from daily life: mineral water. Mineral water is obtained from natural sources and comprises a variety of the ions to be used according to the present invention. The label on a bottle of mineral water lists ions present, along with their respective concentrations. Nevertheless, there are no taste concerns with mineral water, or health concerns. It is thus not clear to the applicant why the addition of the same ions to an alcoholic beverage should have an adverse influence on the beverage's taste, which usually is dominated by other components.

The present invention has been thoroughly tested. No adverse effects on the taste of the beverages (the taste of perfumes is irrelevant anyway) has been observed. We

respectfully submit that the examiner's statements are not pertinent to the patentability of the claims now presented.

c) The quantitative analysis method of the present invention

With respect to the last paragraph on page 3 of the Office Action, applicant feels it helpful to provide an explanation of the method of the present invention.

The present invention provides a method of allowing the control of the genuine nature of goods such as alcoholic beverages or perfumes. As has been pointed out in section [0003] of the published specification, the aim of the present invention is not only to allow a verification of the source of such a product, but more importantly whether any manipulation of said product has taken place. Frequently, alcoholic beverages or perfumes are adulterated (i.e. diluted). As explained in section [0005] of the published specification, such a dilution is carried out e. g. with alcoholic "backyard" products, cheap alcoholic substances which have been manufactured without the deliverance of the usual tax on such products. Apart from the fact that this is clearly undesirable for tax authorities, such dilution frequently also causes a health problem in that the cheap alcoholic products contain larger amounts of toxic methanol.

In sections [0008] to [0010] of the published application, several requirements imposed on marker substances for alcohol beverages or perfumes are enumerated. The present invention now provides a possibility of marking alcoholic beverages and perfumes in such a way that all of those requirements are met and in parallel it is possible to detect any adulteration of the products. The solution of the present invention resides in the use of specific marker compounds, i.e. ions contained in standard seawater (not the seawater itself). Apart from the fact that those ions, as has been pointed out in detail above, are compatible with human and animal health, they have the great advantage that they can be readily quantitatively analyzed.

A quantitative analysis is necessary for detecting any possible adulteration of alcoholic beverages or perfumes. It does not suffice to merely detect the presence of a certain ion in those products, since even when adulterated said ion would still be present in the product. It is rather necessary to detect the exact concentration of said ion in the product and verify that said concentration has not altered.

With this background information in mind, it is easy to understand what the concentrations in amended claim 18 mean: according to the present invention, first of all it is verified in step a) whether an ion from the groups of ions contained in standard seawater (as defined in the present specification) is present in the material to be marked. Step a) of amended claim 18 requires that such an ion be present in a very low concentration level in the original material, i.e. below 50 ppm. The reason for this requirement is quite clear: it is generally advisable that as few marker substance as necessary is added to the product, in order to maintain the product quality. For that purpose, according to the present invention an ion is selected as marker substance which does occur in the unmarked material only in a very low concentration. Then, only a little of that marker substance has to be added.

As explained in detail above, the present invention is a quantitative analysis method. In other words, the exact concentration of the ion in the marked state is to be detected. It is known that any analytical method suffers from a certain error margin, known as standard deviation. As pointed out in section [0045] of the published specification, requiring an increase of the concentration level of the marking ion by at least the factor of 3 ensures that the difference is high enough to exceed the value of the standard deviations of measurement methods used. In other words, by requiring at least an increase of the concentration level of said ion by the factor of 3, the correctness of the quantitative analysis method is guaranteed.

These are the reasons for the definitions of the concentrations in amended claim 18 and likewise the other claims. In order to avoid any uncertainty, the examiner is drawn to the fact that the first concentration level of below 50 ppm refers to the concentration of the ion in the unmarked state (i.e. before the marking composition is added). After the marking composition has been added, claim 18 requires that the concentration level has increased by a factor of 3. Of course, then the concentration level of said ion in the marked material should and frequently will exceed the level of 50 ppm. However, claim 18 does not require that in the marked material the ion is still present in a concentration level of below 50 ppm.

d) Specific claim objections

On page 4, top, of the present Office Action, the examiner has raised several specific objections against claims 18, 24, 42 and 43. Those objections will now be addressed: As explained above in detail, the method according to claim 18 is related to the use of at least one ion which also occurs in standard seawater as a marking material.

According to step a) of claim 18, it has to be first identified whether such an ion is present in the substance to be marked. If this is the case, then in step b) a marking composition comprising said ion is added. The wording of amended claim 18 has been clarified to clearly reflect the above.

Concerning step c) of claim 18, applicant respectfully submits that any conventional method of adding such a marking composition to such a marking material is suitable in accordance with the present invention. Usually, as also shown in the examples of the present application, a liquid marking composition is simply blended with the liquid alcoholic beverage or perfume. Applicant respectfully submits that no undue burden or difficulty is associated with the step of incorporation.

With respect to the use of the term "standard seawater" in the claims, that term is defined by the applicant in paragraph [0028] of the published US application. Accordingly, it is respectfully submitted that this term is clear and does not have to be deleted.

With respect to the term "field audit analysis" in claims 42 and 43, please see, e.g., section [0053] of the published application. From this passage, it becomes clear that this term is to be understood in the context of the present invention to mean an analysis which is carried out at any place, i.e. which does not have to be carried out in a chemical laboratory using large and expensive equipment. This is a particular advantage of the method of the present invention: the analytical devices required for carrying out the method of the present invention are quite cheap and small and thus allow a ready detection of the genuine nature of the detected product also outside a laboratory, i.e. "in the field".

2. The present invention is novel and not obvious.

The examiner has cited Anderson (US 5,849,590) as anticipating the claims of the present application. This rejection is respectfully traversed.

The amended claims are novel over Anderson, inasmuch as Anderson provides no explicit disclosure of the marking of alcoholic beverages or perfumes. The materials to be marked in Anderson are quite different (e. g. crude oil, polluting substances or explosives). Moreover, as explained in detail below with respect to the question of non-obviousness, Anderson is related to a qualitative analysis method and not to a quantitative analysis method.

Moreover, the subject matter of the present claims is also not rendered obvious by Anderson. A detailed reasoning for this conclusion is given below.

Anderson is considered to be the closest prior art document. Applicant respectfully submits that the subject matter of currently amended claim 1 differs from the teaching of Anderson in at least two ways:

(1) The materials to be marked and authenticated are not the same: according to amended claim 1, the material must be an alcoholic beverage or a perfume. On the other hand, Anderson specifically addresses the marking of completely different materials which are polluting the environment, are toxic or are explosives.

(2) There is no clear and unambiguous disclosure of the use of ions which are contained in standard seawater as markers.

Furthermore, Anderson does not disclose the last feature of amended claim 1 according to which the concentration level of the said at least one ion in the marked material is increased in step c) by at least the factor of 3, as compared to the concentration level of the ion present in the unmarked material.

The problem to be solved by the present invention is to provide an in-product marking method for alcoholic beverages and perfumes, wherein said marking method allows the verification of the genuine nature and the absence of dilution of said products in a cheap and quick way suitable for field audits, the markers having to be compliant with public health and prescriptions of regulatory bodies.

According to the present invention, this problem has been solved by a method having the following features:

It is a quantitative analysis (see feature b) of amended claim 2 and feature b) of amended claim 9).

Specific markers are used, i.e. ions which are comprised in standard seawater (see feature b) of amended claim 1).

These features are responsible for the following advantages of the present invention: The quantitative analysis method of the present invention allows the detection of a possible dilution of the alcoholic beverages of perfumes which are marked (see above discussion under section 112).

The use of ions which are comprised in standard seawater as marking materials has the following advantages:

a) In contrast to various organic markers, such ions are robust in an aqueous environment.
b) Such ions are not subject to regulatory concerns, because seawater has proven to be compatible with human health for millions of years.
c) These ions can be quantitatively analyzed in a simple manner using a sensor, such as an ion-selective electrode, even in goods containing a significant content of ethanol, such as the alcoholic beverages and perfumes defined in the amended claims. This is in contrast to the recommendation that ion-selective electrodes should be exclusively used in aqueous environments, and thus an unexpected benefit (section [0058] of the published US-application).

It is respectfully submitted that the present invention is not rendered obvious by the teaching of Anderson, since the above features and advantages are not derivable from said reference.

Anderson is clearly limited to a qualitative analysis of the material: col. 7, lines 64 to 66, clearly state that the teaching of Anderson eliminates the need for quantitatively analyzing the tagging agent. As one can gather from e. g. column 3, lines 59 to 60, the invention described in Anderson pertains to a method for identifying the source of a transported chemical shipment: one only wants to verify whether a certain product

such as a pollutant or explosive comes from a specific source. However, one does not want to verify whether the product itself was subject to counterfeiting, e.g. by dilution.

For the purpose of Anderson, it suffices to identify whether a specific compound or element is present at all in such a material.

For the reasons set forth above, a qualitative analysis method is not suitable for solving the problem underlying the present invention. With a qualitative analysis, one would never be able to verify whether an alcoholic beverage or a perfume has been diluted or not. In consequence, the teaching of Anderson goes in a different direction than the present invention.

Anderson does not refer to the use of ions contained in standard seawater as marking materials. While there may be an accidental overlap between the rare-earth elements used in one embodiment of Anderson and the list of ions suitable for the present invention, it nevertheless has to be acknowledged that Anderson does not provide any suggestion to specifically use ions present in standard seawater, let alone that those ions can be quantitatively analyzed even in a solution containing a significant amount of ethanol.

The materials which actually are marked in Anderson are not intended for human digestion or human application. Therefore, health concerns are not a problem, and the teaching of Anderson is not limited to ions which have been proven to be compatible with human health, e.g. ions present in standard seawater. There is no suggestion in Anderson that any of the methods described therein was applicable to field audits of alcoholic beverages or perfumes.

Anderson comprises a vague disclosure of different embodiments: the marking of bulk goods such as crude oil with non-radioactive isotopes, such as deuterated compounds

(embodiment 1, col. 3, line 59 to col. 5, line 60), the tagging of fluid compositions such as gases or liquids with non-radioactive compounds which are not naturally occurring (embodiment 2, col. 5, line 61 to col. 7, line 38) , and the tagging of solid chemical compositions such as explosives with rare-earth elements as possible tagging agent (embodiment 3, col. 7, line 41 to col. 10, line 22). The teachings of the three different embodiments of Anderson cannot be readily mixed with each other. For example, Anderson's statement at column 4, lines 21 to 23 – that the shipment of any chemical commodity, regardless of method of shipping or chemical structure of the commodity, such as crude oil, refined oil, grains, processed and unprocessed chemicals as well as bulk refined products – is made in context with embodiment 1, not in relation to the other embodiments. This difference of the various embodiments is highlighted by the fact that the embodiment 3 of Anderson was only newly added to an earlier patent 5,474,937 of the same applicant in a continuation-in-part application.

The vague and speculative character of Anderson must be taken into consideration for the question of patentability. It is respectfully submitted that only clear, credible and reproducible disclosures may constitute valid prior art. The examples of Anderson exclusively refer to embodiment 1. In other words, the disclosure in Anderson concerning embodiment 2 and 3 is of speculative nature. No evidence is given that the those embodiments actually work.

Claim 18 now limited to a method for marking an alcoholic beverage or a perfume, recites steps of:

a) identifying at least one marker ion – one contained in standard seawater – present in said material at a concentration below 50 ppm in the unmarked state;

b) selecting a marking composition comprising the marker ion; and

c) incorporating the marking composition into the beverage or perfume in a quantity sufficient to increase the concentration level of the marking ion by a factor of at least 3.

Claim 18 distinguishes the invention from Anderson, and is not obvious from it. All the other claims depend ultimately from claim 18; each is deemed allowable for the limitations it inherits from preceding claim(s), in combination with the additional feature(s) it recites.

We earnestly believe the claims now presented are patentable over the prior art of record, and that this application is in proper condition for allowance.

Respectfully submitted,

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